International Scholars Journals

International Journal of Histology and Cytology ISSN 2756-3707 Vol. 13 (3), pp. 001-009, March, 2025. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Participatory Action Research on Vulnerability and Poverty in Moyamba District: A Study of Three Chiefdoms

Koroma, B. M.[1]*, Alpha, R.[2], Kaimbay, R.[3], Koroma, I. H.[4] and Minah, A. B.[5]

[1]Institute of Environmental Management and Quality Control, School of Environmental Sciences, Njala University, Sierra Leone.
[2]Department of Environmental Health, School of Community Health Sciences, Njala University, Sierra Leone.
[3]Directorate of Planning and Information, Ministry of Health and Sanitation, Sierra Leone.
[4]Department of Environmental Health, School of Community Health Sciences, Njala University, Sierra Leone.
[5]Njala University Hospital, Njala Campus, Sierra Leone.

Accepted 7 October, 2024

Participatory action research (PAR) techniques were used to research application of vulnerability poverty analysis (VPA), specifically to identify farmers' exposure to health risks in the farming season and their levels of coping ability in three chiefdoms in Sierra Leone. This research also provides an understanding of the long-term factors affecting farmers' ability to respond to coping mechanisms and their susceptibility to crisis as well as their resilience for survival or recovery from the crisis. In Sierra Leone, famers' health is a crosscutting issue affecting development as measured by increasing or decreasing agricultural productivity, yet improvement of health is often overlooked in policy strategies. In agricultural communities, poor health reduces income and productivity, further decreasing people's ability to address poor health, thus inhibiting rural household livelihood improvement. The objective of this research was to apply PAR techniques involving famers' responses from self-organized group discussions and questionnaire administration. Many variables were analyzed including: village profiles, types of vulnerability, underlying causes and consequences, and the coping strategies, as well as opportunities for action. Key issues identified include lack of mutual assistance to ensure productive pursuits; access to agricultural inputs; health risks due to unfavourable climatic conditions (extremely hot in the dry season and flooding in the wet season); unsafe drinking water; and the prevalence of diseases such as malaria, diarrhea, typhoid fever, etc. Involvement of village members found that the months of June to September, and February to May were indicated as hungry seasons and were periods of the highest vulnerability risk. During periods of inadequate food supplies and lack of clean water, active household farmers faced increased infections such as bronchitis, conjunctivitis and malaria. Costly visits to peripheral health units (PHU) and traditional healers perpetuate the vicious cycle of poverty. Communities recommend that goals of future programs include enhanced higher agricultural productivity, increased family earnings and nutrition, improved labor productivity and better health and well-being. Policy strategies by local governments must be all inclusive planning for health care interventions in critical period of farming calendar at rural level.

Key words: Participatory poverty analysis, health, agricultural productivity, farmer efficiency.

INTRODUCTION

The relationship between agricultural efficiency and poverty is intertwined. In agricultural communities, poor health reduces income and productivity, further decreasing people's ability to address poor health and inhibiting economic development (Hawkes and Ruel, 2006). Higher agricultural productivity affects family earnings and nutri-tion, which in turn improves labor productivity and results

*Corresponding author. E-mail: bashiru.koroma@yahoo.com. Tel: +232 76 706 819/+232 33 546 953.

in better health and well-being (Oshaug and Haddad, 2002). The relatively low level of endowments in farming assets that characterizes poor households can significantly impede agricultural efficiency. In situation analysis from this perspective, farmers' health is viewed as a durable capital stock that yields an output of healthy time. Individuals are endowed with an initial amount of this stock that depreciates over time and can be increased by investment. By investing in health, households expect to increase the stock of available healthy time, which will increase the amount of time available for earning income or for producing consumption goods. Extending traditional agricultural household vulnerability poverty analysis, Pitt and Rosenzweig (1986) developed a framework that allows the evaluation of the impact of change in health on productivity, labor supply, and overall farmer income. Pitt and Rosenzweig's extension involves incorporation of a health variable into the utility function and introduction of an explicit production technology for health. Health as a capital good can either improve or reduce households' productive ability. A study of women farmers in mixed cropping systems found that the vast majority suffered from intense muscular fatigue, heat exhaustion, and skin disorders, limiting their ability to attend crops (Cole, 2006). Poor health will result in a loss of days worked or in reduced worker capacity, and this is likely to reduce output (Antle and Pingali, 1994). For example, prolonged exposure to pesticides could cause cardiopulmonary problems, neurological and hematological symptoms, and adverse dermal effects (Spear, 1991), which could significantly hamper farmers' work capacity in the field and reduce their management and supervision abilities.

As noted by the World Bank (2007), illness and death from HIV/AIDS, malaria, tuberculosis, and other diseases reduce agricultural productivity through the loss of labor, knowledge of productive adults, and assets to cope with illness. Proposed by Lipton and de Kadt (1988), the lack of coordination of policymaking between agriculture and health undermines efforts to overcome ill health among the rural poor and gives pervasive threats to agriculture's role in alleviating many of the world's most serious health problems.

Understanding the meaning of vulnerability in this context

Chambers took a broad perspective in defining "vulnerability". He proposed that exposure to contingencies and stresses, and difficulties in coping with them (Robert, 1989) decreased ability for alternative actions. Vulnerability appears to have both external and internal aspects. The external aspect of vulnerability relates to risks, shocks and stresses to which an individual or household is subjected to many of which may be uncontrollable. Internal aspect relate to an individual's or household's level of defenselessness or a lack of means to cope without damaging loss, or without becoming or Being physically weaker, economically Impoverished, socially dependent, humiliated, or psychologically harmed. Vulnerability is linked with people's net assets, which may include their investments, stores, and claims (fines for late payment of debts) (Jeremy, 1989). Examples of investments are: personal investments (education, training and health), individual productive assets (live-stock, farming equipment, houses, land, trees, and wells), and collective assets (soil conservation, water harvesting, irrigation systems and access to common property resources). Other assets in the household value-chain include food stores, granaries, or rice mills; and money or bank accounts. Individuals or households can make claims on family, friends, or other households within the community, for production resources, food, labour or livestock. In addition, vulnerability is linked with people's level of poverty, ill-health and malnutrition. These can have different effects on individuals or households over time.

Health security

This means having low exposure to disease and high access to health services. Poor populations in the study area have high exposure to disease and have poor access to health services or cannot afford medical care. Poor water and lack of sanitation services contributes to high rates of diarrhea death among infants and children. Malaria and tuberculosis are also rampant HIV/AIDS on the increase and is devastating large sections of the population. Health security is closely related to access to basic services of water supply, sanitation and access to health promotion education. Integrating human security into local development strategies ensures that vulnerabilities to risks and crisis that culminate into ill health are addressed and minimized where possible. The World Food Programme (WFP, 1999) views this concept of vulnerability as a function of exposure to risk and the ability or inability to cope. In the WFP formula, vulnerability increases as the ability to cope decreases, and is expressed as follows:

Vulnerability = Exposure to risk + inability to cope.

Exposure to risk is the probability of disaster occurring and its impacts in terms of severity on different geographical areas and population groups. This also includes population sub-sets such as women and children. The ability of a population to cope is their capacity to physiccally survive the shock with their liveli-hood more or less intact by depending on their income and other assets such as labor, physical assets, productive assets, social capital, and other support systems and entitlements. Vulnerability of an individual or household is also affected by social/organizational and motivational/ attitudinal characteristics of a community (Moser, 1998).

Important elements of participatory action research (PAR)

Participatory action research (PAR) is a research methodology for achieving action or change and research outcomes (Dick, 2000). PAR is a collaborative process, where the participants in the study serve as co-researchers. To achieve both action and research outcomes, PAR must be flexible and responsive to the situation and the people being studied or researched, and mindful of who will learn or benefit from the research findings. PAR is used in real situations and its primary purpose is to help solve real problems (O'Brien, 1998). There are many different forms of PAR, depending on who is participating, at what stages they are involved and specific objectives. For instance, using PAR for conducting research on farmers' health at the village level, local people are the primary focus; and evolve to research partners, not subjects, or research objects (Huizer, 1997). Retrospectively, the important elements of PAR are participation, action, and research and are defined as they were applied in this project.

Participation

Participation is regarded as "the first step in a process of consciousness awakening or concientisation of the people through their own analysis of and reflection on the causes of poverty and on the socioeconomic structures and processes which affect their lives. No development activity can be successful until this process is well underway" (Burkey, 1993). Therefore, people who are directly affected in data collection and analysis, and in planning, implementation, and monitoring and evaluation, should be included in PAR.

Action

It involves all relevant parties in actively examining simultaneously current action (which they experience as problematic) in order to change and improve it. This is accomplished by critically reflecting on the historical, political, cultural, economic, geographic and other contexts which make sense of it (Wadsworth, 1998). Success of PAR methodology in problem resolution depends upon the agreement and commitment of those affected by the research. Therefore, the researchers should try to involve them directly in all stages of the research process as equal partners (Dick, 2000).

Research

It is an experiential methodology for the acquisition of serious and reliable knowledge and is categorized by adherence to organizational and methodological standards. In this application these techniques are being used to understand the poor, oppressed and exploited groups at the grassroots level. Research data can be used to craft creative and transforming leverage as expressed in measured success of specific projects, acts or to document barriers in the achievement of goals towards social transformation (Luers, 1997). PAR oriented research provides a fluid methodological format, which tangible actions are researched, changed and re-researched within the research process as dictated by research participants. Nor is it simply an exotic variant of consultation. Instead, it aims to be active co-research, by and for those to be helped. It tries to be a genuinely democratic or non-coercive process whereby those to be helped, determine the purposes and outcomes of their own inquiry (Wadsworth, 1998). PAR provides an opportunity for those who take part to learn from the process. It is a "learning-by-doing" method. Therefore, by use of PAR this research was centered on vulnerability poverty analysis (VPA), specifically identifying farmers' exposure to health risks in the farming season and their levels of coping ability. It also includes an understanding of the long-term factors affecting farmers' ability to respond to their coping mechanisms and their suscep-tibility to crisis as well as their requirements for survival or recovery from the crisis.

Research objectives

The overall goal was to investigate farmers' exposure to risks and crisis that contribute immensely to their ill health and resilience to cope with the state of vulnerability.

Specific objectives

1) To identify causes of farmers' vulnerability, conse-quences and coping mechanisms in the six villages of the study areas and analyze future impact if modifi-cations to these factors could be achieved through policy changes.

2) To mainstream (to put in place the policy change strategies) (need a definition of "mainstream") the policy instruments that may be needed to improve the health of farmers' and achieve simultaneous increase in their agricultural productivity and livelihood improvement.

RESEARCH METHODOLOGY

Six villages were randomly selected. A situation analysis was conducted during May to December 2010 to articulate the process of information gathering concerning objectives 1 and 2. Basic issues were discussed at the District and Chiefdom levels to reaffirm the research agenda and establish a timeframe for collaborative participation and to ensure local inputs for the joint-learning process. These included:

Selection of fieldworkers

Selection of fieldworkers was based on the social skills of the counterparts for participatory action research (PAR), their demonstrated superior communication abilities in the local language(s) of the participating villages. This facilitated the PAR at the district, chiefdom and village levels to collect and analyze first hand information in the study area.

Choice of key informants

Two levels of informants were surveyed in this study: village participants and governmental experts. All village respondents were viewed as potential key informants through the process of semi-structured interviews (SSI) and focus group discussions. This motivated them to identify knowledgeable and honest representatives for additional key informant interviews and focus group discussions. Their early involvement in the process reduced the problem of gender bias. Secondary data also improved the efficiency of information gathering by increasing the explanatory values and avoiding the effort of gathering the same information twice. The main information sources included existing knowledge among local government, UN Agencies, local nongovernmental organizations (NGOs), and other notable research institutions in the districts. The secondary data served as background material, particularly in relation to the contemporary context of public health, over time. A desk study of existing information reviewed other reports and articles of similar previous studies.

Data analysis

Data were analyzed qualitatively using normative and descriptive techniques. This was achieved from the outcome of situation analysis of the participatory action research (PAR). Household surveys also formed part of the qualitative analysis, which was incorporated with data mapping and seasonal diagramming of the induced factors affecting farmers' state of vulnerability.

RESULTS AND DISCUSSION

Profile of study area

Formal dialogue and focus group discussions were held in May and December 2010 with local government officers and local NGOs, using semi-structured interviews (SSI) and sourcing additional background information from village records. Direct village observations were also made. Villagers' responses to self-organized group discussions and questionnaire administration were summa-rized in a qualitative manner to interpret the village profiles, types of vulnerability, underlying causes and consequences, and the coping strategies, as well as opportunities for action. Table 1 shows the profile of study areas in Moyamba District.

Types of vulnerability, underlying causes and coping strategies

Assessing different household states of vulnerability in all the villages surveyed, a number of self-reinforcing human crises were found, such as, lack of mutual assistance to ensure productive pursuits from the focus group discussion; inadequate or lack of access to agricultural inputs for most households from the household surveys; health risks due to unfavourable climatic conditions (extremely hot in the dry season and flooding in the wet season) from the focus group discussion; unsafe drinking water from household surveys; and prevalence of diseases such as malaria, diarrhea and typhoid fever from household surveys. Observations also provided an eyewitness account of malnutrition and hidden hunger suggesting possible micro-nutrient deficiencies among children in the villages. Breastfeeding is common for infants up to an average of 18 months. Members of the focus groups suggested that the sharp rise in malnutrition at weaning stage is caused by a lack of complementary foods. The incidence of illnesses, especially diarrhea and malaria, is high among the 6 to 24 months age group, and are major contributors to malnutrition. Table 2 outlines a summary of problems analyzed in the six villages, their underlying causes, coping strategies and opportunities for action. In addition to the focus group discussions, semi-structured interviews were held with key informants including teachers and youth leaders in the villages of the study areas about the status of youth and children. The study period however, coincided with terminal examinations, which limited the reach of a larger youth sub-group. In general, all the respondents confirmed that youth make up a very large percentage (preferably 40%) of the population in each of the study areas.

A large proportion of them (60 to 70%) lack parental care and supervision with enormous community and peer group influences that lend themselves into risks and crises. In specific terms, the following were revealed as the major types of youth vulnerability in the study areas (Table 3).

Seasonal affectations on livelihoods

From the respondents' focus group discussions, seasonal affectations were clearly identified in the vulnerability poverty analysis. Taking cognizance of the farming calendar, June to September, and February to May were indicated as hungry seasons. During these periods, active household farmers are faced with incidence of disease infections such as bronchitis, conjunctivitis and malaria. Their frequent visitation to peripheral health units (PHU) and other traditional healers leaves them in vicious cycle of poverty (Graph 1). As a result of heat shocks from November through March of the following year many farmer are affected by conjunctivitis, which eventually reduce labour supply during the active farming period as indicated in Graphs 1 and 2. A high household labour supply is also needed for controlling birds ("birds scaring") during harvesting, but severe hunger and other

Table 1. Profile of study areas in Moyamba District.

Name of village	Description*	Households	Households interviewed (%)
Kpangbama	Heavy farm work during the wet season, lack of electricity, poor sanitary facilities, drink from springs and streams, no family planning systems, poor road network.	75	40 (53)
Kwellu	Lack of safe drinking water, fetching water from near by stream in the village, village flood during the wet season, bridges constructed from wood, no health centre.	60	30 (50)
Bauya	Inadequate health centre, hunger and malnutrition evident, drink from near by stream, many abandoned houses (railway quarters).	54	30 (55)
Tongie	Government workers absent, stone mining, dominated by the aged.	54	30 (55)
Yoyema	More males than females, predominant extended family system, community forestry activities, frequent internal migration.	48	30 (62)
Lungi	Black fly infestation, drink from nearby stream, no health education, more females than males.	45	30 (67)

*Note: Descriptions obtained from focus group discussions.

related health problems in composite calendar (Graph 3) continue to affect the farmers' agricultural productivity. Work by Cole (2006), found that many similar famers suffered from intense muscular fatigue, heat exhaustion, and skin disorders, so severe forcing them to take days off from attending crops. Hence, coordination of policymaking encompassing both agriculture and health care services appears to be strongly indicated to improve health and work capacity among the rural poor. These data underscore the importance of improved agricultural methods to increase productivity to stabilize seasonal food supplies. Agriculture together with greater access to health care services can make significant strides towardpoverty alleviation.

CONCLUSIONS AND RECOMMENDATIONS

Participatory action research (PAR) is recognized as an effective technique for use in rural development, and appears to be more effective than traditional methods of gathering information on household vulnerability and poverty analysis. The PAR approach can better investigate aspects of rural livelihoods and resource management conditions that researchers and develop-ment officers need to understand in order to plan special programmes on crosscutting issues such as the ill-health of farmers in effort to mainstream appropriate health service delivery in the Local Government Development Plan and manage them effectively. PAR method, when used for vulnerability poverty analysis practically emphasizes the importance of rural systems and local knowledge, and is especially appreciated for its ability to put the people central to the enquiry. As a systematic sequence of interdisciplinary activities, the central feature focuses on local people's participation to produce accurate information and analyses of rural livelihoods in an iterative and efficient manner.

The focuses for data collection are mainly qualitative, nonetheless, with respect of this study, the method could be used in combination or sequence, learning about differences rather than estimating averages. In attempting to use this method, information was gathered for seasonal affectations on farmers' livelihoods in the study areas, thus appropriating clear vision types of vulnerability, causes and consequences, coping mechanisms and opportunities for action. Although this study surveyed six villages and 190 households, these findings may not be applicable to other villages in other locations. However, the authors feel that significant evidence supports the following goals and conclusions: narrative testimony indicated that goals for future programs at the rural level should include training or interventions that:

1) Enhance higher agricultural productivity,
2) Increase family earnings and nutrition,

Table 2. Summary of information gathered at village surveys and focus groups.

Type of vulnerability	Underlying causes	Coping strategies	Recommendation for action
Human shock	Death or long term illness of household head, collapse of house.	Contribution byother family members, support from institutions, sleeping in makeshift houses, became internally displaced persons.	Local Government initiatives to provide support for children's welfare help in constructing houses.
Agricultural loss	Livestock taken away by thieves, death of poultry due to disease, boli land idle because of no labour, no chemicals and mechanized farming, climate change, pest disturbance, poor management of seedlings.	Imported rice and other food items.	Support for mechanized farming.
Economic loss	Poor harvest, remote or no micro-credit system, no livestock, slow trading, increased prices.	Loans, change of eating habit and time, change clothing type and quantity, differ children's schooling, incurring debts.	Effective and efficient micro-credit, more support for school children.
Lack of information	No frequent visit by organizations, poor road network preventing travel to educational training sites.	Listen to radio from MODGA.	Improve road network, frequent visit.
Poor infrastructure	Most houses were burnt during the war, mud and thatched houses, over crowded houses, poor roads, poor water and sanitation supplies, few and downgraded health centers.	Construction of make-shift houses, foot paths and rough gravel roads, drinking from streams wells and springs, using the bush for open defecation, traditional medicine, self administered drugs.	Help construct more houses, construct the roads, improve water and sanitation facilities, improve on current health centers and provide health service delivery.
Chronic hunger	Poor agricultural practices and yield, unemployment, high level of unskilled labour, low income-generating activities.	Eat less and cheap food per day, rely on bush meat and fresh water fish, small scale back yard gardening, extensive breast feeding.	Food supply for school children, assistance in farming.
Indebtedness	Inadequate and disorganized credit system.	Debt settlement by chiefs, batter system (payment of produce for goods taken in the farming season).	Provision of micro-credit facilities.
Low education	Schools far from villages, untrained and unqualified teachers, poor school facilities, no money for books and fees.	Wake up very early to walk to school, postpone the purchase of valuables to pay fees and buy books.	Provide more learning facilities.

Source: Focus group discussions.

3) Improve labor productivity and;

4) Achieve better health and well-being through strategies in health care interventions.

Therefore, we recommend and conclude the following:

1) Many households in this study were asset poor and marginalized. They have no access to minimum basic human needs such as access to clean water and sound preventive health care. Therefore, further analyzes are needed to define key problems and causes of these problems. Specific attention will be required to prioritize interventions for amelioration of rural household vulnerability risks and crises.

2) Communities identified women at increased risk during

Table 3. Youth vulnerability, causes, coping strategies and recommended action.

Type of vulnerability	Underlying causes	Coping strategies	Recommendation for action
Smoking	Community and peer group influences.	Counselling in schools and at home, awareness raising on the rights of the child.	Charge heavy taxes on cigarettes to increase price of cigarette. Label cigarette packets as "smoking is dangerous to health". Advocate for the inclusion of subjects/topics that deal with the dangers and mitigation of cigarette smoking, drug abuse, alcoholism, etc., in schools.
Drug abuse	Stress, extreme poverty, community influence.	Counselling in schools and at home.	Organise youth workshop or collaborate with local partners involved to address the issue of drug abuse, Advocate for the inclusion of subjects/topics that deal with the dangers and mitigation of cigarette smoking, drug abuse, alcoholism, etc., in schools.
Alcoholism	Lack parental care, community influence, peer group pressure.	Counselling in schools and at home.	Also address the issue of alcoholism in the proposed youth workshop, Advocate for the inclusion of subjects/topics that deal with the dangers and mitigation of cigarette smoking, drug abuse, alcoholism, etc., in schools.
Teenage pregnancy	Financial hardship, peer group influence, lack of parental care and support, insufficient knowledge of family planning.	Counselling in schools and at home. Conducting youth forum in schools, awareness raising on the rights of the child (ARoC).	Organise youth workshop in collaboration with local partners on contraceptive education Promote other social amenities in schools to divert girls attention from sex. Continue with the ARoC
Low level of education	Schools far from villages, untrained and unqualified teachers, poor school facilities, no money for books and fees.	Wake up very early to walk to school, postpone the purchase of valuables to pay fees and buy books. Support from NGOs such Plan Sierra Leone and other agencies.	Provide more learning facilities.
Unemployment and low income	Lack of employment facilities, low income activities; lack of skills, isolation/remoteness of villages.	Dependence of family kin, male out-migration in search of wage labour.	Income-generating programmes, vocational training, employment in local construction activities (feeder roads, schools, community centres).
Poor social status	Returnees from civil war; poor living residences caused by financial limitations	Living with family or kin groups, routine cleaning by members of the family	Build low-cost and low-rent housing.
Poor conflict management	Livelihood stress, clash of culture, struggle for supremacy, stigmatization of ex-combatants and war affected children, ignorance on psycho-social skills.	Violent ways of resolving conflict, avoidance.	Training on youth leadership and non violent ways of resolving conflict.

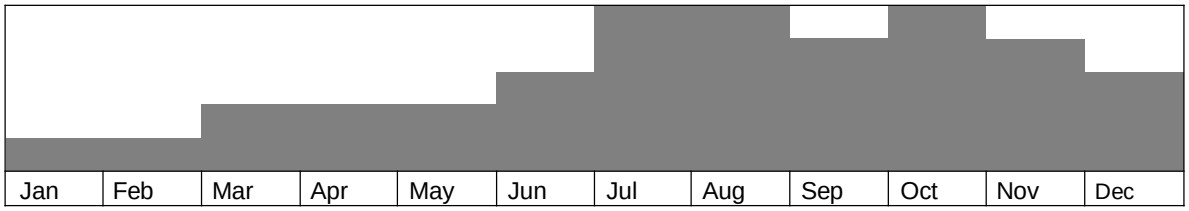
Table 3. Contd.

Poor juvenile justice (long detentions, torture, starvation, etc)	Ignorance on the part of parents/guardians, used as punishment for crimes such as thieving, use of obscene languages, absconding from homes, etc.	Running away from home, becoming street children, hard labour, early marriage, teenage pregnancy, early entrance into adult life.	Advocate for an increase in approved schools/remand homes, strengthen school management committees, promote reunions, establish adopted family systems, and promote juvenile justice.
Child trafficking	Lack of parental care, sudden death of parents/care takers, peer group influences, financial hardships, voluntary prostitution, child labour, etc.	Early marriage, desertion of family home to become street children, Child Advocacy Group action.	Human rights workshops on child care in collaboration with Child Advocacy Groups, Community awareness raising in child care and protection, advocate for the enforcement of child rights policy, improve on the support for child education, especially girl child, etc.
Gender-base violence	Rampant rape attempts in rural settings, undue delay of child labour, children doing the work of adults, violent sexual attempts by caretakers (mostly uncles and cousins), etc.	Early marriage, desertion of family home to become street children, Child Advocacy Group action.	Human rights workshops on child care in collaboration with Child Advocacy Groups, Community awareness raising in child care and protection, advocate for the enforcement of child rights policy, improve on the support for child education, especially girl child, etc.
Poor environmental sanitation	Poor toiletfacilities, poor hygiene, unsafe drinking water quality, low level of knowledge on environmental sanitation, etc.	Use of traditional medicines, spiritual healing, etc.	Promote hygiene and health education in schools, provide or continue to support clean and safe drinking water facilities, VIP latrines/other modern rural toilet facilities, adopt a family scheme on environmental sanitation.

Source: Key informant interviews.

Bronchitis						*	*	*	*			
Malnutrition	*	*	*	*					*	*	*	*
Conjunctivitis						*	*	*	*	*		
Malaria	*	*	*	*	*	*	*					
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May

Graph 1. Disease calendar.



Graph 2. Labor calendar.

the farming season because they carry the burden of more than 100 h per week unpaid job (fetching water, preparing the daily meals, going fishing, working in the farm, fetching wood, etc.). Development programmes

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Severe hunger												
Hardest work period for men												
Hardest work period for women												
Management of chickens and goats	Kill For Food							Sell at Low Price				
Health problems	Malnutrition Malaria		Respiratory Problems					Malnutrition				
Indebtedness	**	**	*									
Source of food	Credit	Gathering, Credit			Begin Harvest	Reimburse Debts Eat From Harvest		Salary Labor, Garden, Oil palm				
Fieldwork												
	Rainy Season		Cold season		Spring			Dry Season				
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May

Graph C. Composite calendar. Graph A to C. Seasonality diagramming to determine seasonal affects on livelihoods. Source: Key Informant Interviews in focus group discussions.

must therefore, be more inclusive of women as they seek opportunities to improve their productive lives as key contributors to household livelihood improvement.

3) Most importantly, building the local capacity at all levels on issues specifically designed to serve the poor (such as food security, healthcare education, agricultural and extension services, and institutional reforms) through participatory learning action (learning-by-doing) must be an immediate priority of both the local government and NGOs working together with the rural poor.

4) Ongoing research in four specific pilot locations of the Sierra Leone Agricultural Research Institute (SLARI) operational platforms countrywide will translate the information into valuable instruments on the effects of health illness affecting the distribution channels within the households' production system, thereby, mainstreaming these instruments into policy that may be needed to improve on farmers' health and achieve simultaneous increase in agricultural productivity and reduction in household poverty rate.

REFERENCES

Antle JM, Pingali PL (1994). Pesticides, productivity, and farmer health: A Philippine case study. Am. J. Agric. Econ., 76: 418-430.

Burkey S (1993). People First: A Guide to Self-Reliant Participatory Rural Development (London: ZED Books).

Cole D (2006). Occupational health hazards of agriculture. In C. Hawkes and M. T. Ruel, (eds.), Understanding the links between agriculture and health for food, agriculture, and the environment. 2020 Focus 13, International Food Policy Research Institute, Washington, DC.

Dick B (2000). "A Beginner's Guide to Action Research" (Resource Papers in Action Research). (See http://www.scu.edu.au/schools.gcm/ar/arp/guide.html).

Hawkes C, Ruel MT (2006). The links between agriculture and health: An inter-sectoral opportunity to improve the health and livelihoods of the poor. Bull. World Health Org., 84: 985-991.

Huizer G (1997). "Participatory Action Research and People's Participation: Introduction and Case Studies" (20 May 1997) (See http://www.fao.org/waicent/faoinfo/sustdev/PPdirect/PPre0021.html)

Leurs R (1997). "Critical Reflections on Rapid and Participatory Rural Appraisal," Development in Practice, 7(August 1997): 291-293.

Lipton M, de Kadt E (1988). Agriculture: Health linkages. Geneva: World Health Organization (WHO).

Moser CON (1998). "The Asset Vulnerability Framework: Reassessing Urban Poverty Reduction Strategies," World Development 26 (January 1998): 1-19; and United Nations Development Programme and European Commission (EC), Attacking Poverty While Improving the Environment (New York, 2000).

O'Brien R (1998). "An Overview of the Methodological Approach of action Research" (17 April, 1998) (See http://www.web.net/-robrien/papers/arfinal.html).

Oshaug A, Haddad L (2002). Nutrition and agriculture. In Nutrition: A foundation for development. Geneva: Administrative Committee on Coordination (ACC)/ Sub-Committee on Nutrition (SCN).

Pitt MM, Rosenzweig MR (1986). Agricultural prices, food consumption, and the health and productivity of Indonesian farmers. In Singh, Squire, and Strauss (eds.), Baltimore, MD: Johns Hopkins University Press. Agricultural Household Models, pp. 153-582.

Wadsworth Y (1998). "What Is Participatory Action Research?" Action Research International (November 1998) (See http://www.scu.edu.au/schools/gcm/ar/ari/p-ywadsworth98.html).

World Food Programme (WFP) (1999). "An Overview of Vulnerability Analysis and Mapping (VAM)," (Available at http://www.wfp.it/vam_documents/va/va99/html/overcontents.htm. World Bank (2007). World development report: Agriculture for development. Washington, D.C.